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UU10. Impact of sample window choice and location on time delay estimation of transients. Allen E. Leybourne, III (University of Southern Mississippi, Box 5137, Hattiesburg, MS 39406) and Roger W. Meredith (Naval Ocean Research and Development Activity, Arctic Acoustics Branch, Stennis Space Center, MS 39529)

Estimation of time delays between coherent transient signals is biased by the choice and location of the sampling window. For transients that do not tend to zero within the sampling window (self-windowing), the uniform or boxcar window may not be the best choice due to spectral leakage. This is especially important when processing highly asymmetrical transient signals that are not self-windowing as in the case of acoustic ambient noise. When a sample window is used to suppress spectral leakage, a bias in time delay estimation results from a suboptimal window location. Even though the boxcar window produces the least bias in time delay when the transient is self-windowing, it is shown that sidelobe interference is significant for highly asymmetric signals. This work critically examines these effects and describes an iterative procedure to determine optimal location of the transient within any sample window. [Work supported by the Office of Naval Technology.]